

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Isiah Leggett
County Executive

Robert Hoyt Director

January 29, 2010

Martha W. Hynson, Chief Landfill Operations Division Solid Waste Program Maryland Department of the Environment 1800 Washington Blvd., Suite 605 Baltimore, MD 21230

Dear Ms. Hynson:

Please find enclosed, two (2) copies of the Proposed Groundwater Well and Data Collection Boring Locations and associated documentation for the Gude Landfill. As you recall, this work is associated with the Phase 1 – Nature and Extent Study for the Gude Landfill Remediation Project. We respectfully request your approval of the groundwater well and data collection boring locations in order to move forward with the remedial assessment.

If you should have any comments or questions regarding the information, please contact Stephen Lezinski at 240-777-6590 or myself at 240-777-6569. Thank you.

Sincerely,

Stephen T. Lezinski, Engineer III

Steph T. Lyinks.

Montgomery County DEP

Division of Solid Waste Services

Peter R. Karasik, Section Chief Montgomery County DEP

Peter R Kanniel

Division of Solid Waste Services

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Enclosures

cc: Andrew Grenzer, Lead Geologist, Solid Waste Program, MDE (w/encl.)



Topic: Proposed Groundwater Monitoring Well and Data Collection Boring Locations

Gude Landfill, Montgomery County, Maryland

Date: 28 January 2010

PURPOSE

EA Engineering, Science, and Technology, Inc. (EA) prepared this Technical Memorandum to summarize the purpose and logistical considerations for the proposed installation of new groundwater monitoring wells and data collection borings at the Gude Landfill. This work effort is part of Phase 1 – Nature and Extent Study of the Gude Landfill Remediation Approach. The Proposed Groundwater Monitoring Well and Data Collection Boring Location Map is provided as Attachment A.

A site visit was conducted by EA and the Montgomery County Department of Environmental Protection (DEP) to evaluate potential access issues and other site constraints that may impact the proposed groundwater well locations. A photographic log of the pathways to access the proposed groundwater well locations and field notes from the site visit are provided as Attachments B and C, respectively. Note that photographs were not taken for the following proposed groundwater monitoring well locations: MW-6, 7, 8, 9 and 12. Access constraints for MW-6 thru 9 are minimal and MW-12 may need to be located in the cul-de-sac pavement.

GROUNDWATER MONITORING WELLS

The Montgomery County DEP has been monitoring the existing groundwater network at the Gude Landfill since 1984 and updated the monitoring program in May 2009 with Maryland Department of the Environmental (MDE) approval. EA has reviewed the available historical groundwater analytical data in electronic format (from 2001 to Present) and the existing groundwater monitoring well network at the Gude Landfill. Based on EA's review, eighteen (18) additional groundwater monitoring wells are proposed, which are identified in Appendix A.

As background information, existing groundwater monitoring well construction details are provided as Attachment D, Table 1. The proposed groundwater monitoring wells are generally recommended for the following reasons:

• to obtain groundwater elevation data at or beyond the landfill property boundary in areas that are not currently measured by existing groundwater wells;



- to obtain new groundwater samples and chemical constituent data that can be used to assess the integrity of existing groundwater monitoring wells that are reported to have the highest historical concentrations;
- to prepare a potentiometric map to delineate groundwater elevation and flow direction; and
- to identify the extent and potential routes of migration for chemical constituents from the Landfill waste disposal footprint in the groundwater.

Proposed groundwater monitoring well depths are designed to evaluate groundwater concentrations at several intervals of potential impact. For example, shallow/deep well pairs are proposed in areas where there is no existing data and shallow wells are proposed in areas where shallow groundwater data is not available from existing deep monitoring wells. Screened intervals in the shallow monitoring wells will be twenty feet (20) long and will properly intersect the groundwater surface. Screened intervals in the deep wells will also be twenty feet long and will be positioned at the bottom of the borings. Attachment D, Table 2 provides a summary of the location, estimated depth and purpose of each of the proposed monitoring wells.

DATA COLLECTION BORINGS

Five (5) temporary data collection borings are proposed within the Gude Landfill waste disposal footprint. The purpose of the data collection borings are to:

- characterize the waste mass (waste type, cover soil use, compaction, saturation, etc.);
- measure the groundwater elevation within the Landfill; and
- provide a groundwater source for constituent laboratory analyses within the Landfill.

The proposed depth of the data collection borings will be approximately ten-feet below the bottom of waste (estimated to be 50 - 90 feet below ground surface) The data collection borings will be completed with temporary well screens and casings to allow for the collection of groundwater elevation measurements and groundwater samples. Screened intervals in the data collection borings will be twenty-feet in length and will extend from ten-feet above the bottom of waste to ten-feet below the bottom of waste. Following completion of Phase 1 – Nature and Extent Study, the temporary well screens and casings will be removed and the boreholes will be properly abandoned with a cement/bentoite grout. Attachment D, Table 3 provides a summary of the location, estimated depth, and purpose for each of the proposed data collection borings.



ATTACHMENT A Proposed Groundwater Monitoring Well and Data Collection Boring Location Map





ATTACHMENT B Photographic Log



1. View of proposed location for MW-1A/MW-1B facing east.



3. View of the property line marker facing east towards proposed location for MW-1A/MW-1B.



5. View of access way to proposed location for MW-2A/MW-2B facing northeast.



2. View of access way to proposed location for MW-1A/MW-1B facing west.



4. View of proposed location for MW-2A/MW-2B facing northeast.



6. View of access road to proposed location for MW-2A/MW-2B facing north.



7. View of access way to proposed location for MW-3A/MW-3B facing east.



9. View of proposed location for MW-4 facing south.



11. View of potential access way across stream to proposed location for MW-5 facing south.



8. View of access road to proposed location for MW-3A/MW-3B facing southwest.



10. View of access way from Southlawn Lane to proposed location for MW-4 facing northwest.



12. View of potential access way to proposed location for MW-5 facing southwest.



13. View of potential access way across stream to proposed location for MW-5 facing south.



15. View of access way from Bettendorf Court to proposed location for MW-10, MW-11A and MW-11B facing northwest.



17. View of access way from Bettendorf Court to proposed location for MW-10, MW-11A and MW-11B facing southeast.



14. View of proposed location for MW-11A/MW-11B facing northeast.



16. View of proposed location for MW-10 facing southwest.



18. View of access way from Bettendorf Court to MW-10, MW-11A and MW-11B facing northwest.



19. View of proposed location for MW-13A/MW-13B facing north.



21. View of access way from utility right-of-way to proposed location for MW-13A/MW-13B facing southeast.



20. View of proposed location for MW-13A/MW-13B facing west.



22. View of access way to proposed location for MW-13A/MW-13B facing northwest.



ATTACHMENT C Field Notes

FIELD NOTES FROM 1-7-10 SITE VISIT

MW-1A/MW-1B

- Northeastern Landfill Boundary, on M-NCPPC Property.
- ±200 ft. from landfill access road to Property Line Stake (B), near access point.
- ± 20 ft. access between two larger diameter trees.
- ±180 ft. down slope from access point to proposed groundwater well location.
- Potential slope concerns for well drilling equipment.
- Potential tree removal = 0-2 small diameter (4-6 inch).
- Removal of downed trees.

MW-2A/MW-2B

- Eastern Landfill Boundary, on M-NCPPC Property.
- ±185 ft. from Survey Marker (614) down landfill access road to access point.
- $\pm 20-25$ ft. access between two larger diameter trees.
- ±50 ft. from access point to proposed groundwater well location.
- Potential slope concerns for well drilling equipment.
- Potential tree removal = 0-3 small diameter (4 inch).
- Removal of downed trees.

MW-3A/MW-3B

- Southeastern Landfill Boundary, on M-NCPPC Property (near Well 8/8A).
- Access from landfill access road off of concrete pad area.
- Rip rap ditch crossing concern for well drilling equipment.
- \pm 20-25 ft. access between two large diameter trees.
- ± 170 ft. from access point to proposed groundwater well location.
- Removal of downed trees only.
- Avoid watered-in manhole type structure.

MW-4

- Southeastern Landfill Boundary, on County Property (near Well 10).
- Access from Southlawn Lane near Survey Pin (044).
- ±30 ft. access between set boulders.
- ±215 ft. from Property Line Stake (V) to proposed groundwater well location.
- Removal of downed trees and boulders only.
- Stream setback.
- Avoid WSSC manhole.
- Traffic concern upon initial access from Southlawn Lane.

FIELD NOTES FROM 1-7-10 SITE VISIT

MW-5

- Southern Landfill Boundary, on WSSC Property (near Wells 11 & 25).
- Access from Incinerator Lane to landfill access road.
- Access point potential to east and west of existing groundwater wells.
- East Access Location
 - o Small/Large diameter tree removal and ramp building.
 - \circ ±130 ft. from access point to stream crossing.
 - o Stream crossing permit and engineered bridge (less significant).
 - \circ ±150 ft. to proposed groundwater well location.
- West Access Location
 - o Minimal to no tree removal.
 - \circ ±15 ft. from access point to stream crossing.
 - o Stream crossing permit and engineered bridge (more significant).
 - \circ ±50-75 ft. to proposed groundwater well location.
- Stream setback.
- Avoid WSSC manholes.
- Avoid existing groundwater monitoring wells.

MW-6

- Southwestern Landfill Boundary, on County/MCCH Property (near Well 1).
- Access from 600 E. Gude Drive Entrance to proposed groundwater well location.
- Avoid new pond construction and underground utilities/pipes.
- Traffic coordination for exiting the site with Men's Shelter.

MW-7

- Northwestern Landfill Boundary, on County Property (down slope of Soil Stockpile).
- Access from Gude Drive to Transcontinental/Columbia Gas ROW.
- Avoid damage to ROW ground surface.
- Fence cutting and re-wiring to gain access to proposed groundwater well location.
- Minimal tree and shrub removal.
- Removal of downed trees.

<u>MW-8</u>

- Northwestern Landfill Boundary, on County Property (near Well 3).
- Access from Gude Drive to Transcontinental/Columbia Gas ROW.
- Avoid damage to ROW ground surface.
- Fence cutting and re-wiring to gain access to proposed groundwater well location.
- Minimal tree and shrub removal.
- Removal of downed trees.

FIELD NOTES FROM 1-7-10 SITE VISIT

MW-9

- Off Landfill Property to West. Derwood Station South (near Dubuque Ct.).
- County ROW off curb line (need to confirm).
- ±25 ft. clear access point to proposed groundwater well location.
- Minimal land disturbance (depending on standpoint of nearby homeowner).
- Avoid underground utilities/pipes.
- Traffic concern with Community upon work performance.

MW-10

- Off Landfill Property to Northwest, on M-NCPPC Property (near Bettendorf Ct.).
- Cleared land appears to be stormwater drainage area.
- County/M-NCPPC ROW access off curb line to M-NCPPC Property (need to confirm).
- Proposed groundwater well location outside of stormwater drainage area.
- No anticipated tree removal.
- Minimal land disturbance; ground cover is low grasses.
- Avoid underground utilities/pipes.
- Traffic concern with Community upon initial entrance.

MW-11A/MW-11B

- Off Landfill Property to Northwest, on M-NCPPC Property (near Bettendorf Ct.).
- Cleared land appears to be stormwater drainage area.
- County/M-NCPPC ROW access off curb line to M-NCPPC Property (need to confirm).
- Proposed groundwater well location outside of stormwater drainage area.
- Potential Washington Gas Line/ROW (need to investigate).
- No anticipated tree removal.
- Minimal land disturbance; ground cover is low grasses.
- Avoid underground utilities/pipes.
- Traffic concern with Community upon initial entrance.

MW-12

- Off Landfill Property to Northwest. Derwood Station South (near Grinnell Terrace).
- County ROW off curb line (need to confirm).
- Not County Property, then proposed groundwater well location will be in homeowner's front or side yard.
- Homeowner's #15537 and 15538 face the proposed groundwater well location and back up to the Transcontinental/Columbia Gas ROW.
- Minimal land disturbance (depending on standpoint of nearby homeowner).
- Avoid underground utilities/pipes.
- Traffic concern with Community upon work performance.

FIELD NOTES FROM 1-7-10 SITE VISIT

MW-13A/MW-13B

- Northwestern County Property Boundary, (near Property Corner).
- Access from Gude Drive to Transcontinental/Columbia Gas ROW to WSSC access road through County property.
- \pm 20-25 ft. access road.
- ± 15 -20 ft. access point between small diameter trees.
- ±40 ft. from access point to proposed groundwater well location.
- Potential slope concerns for well drilling equipment on access road.
- Stream and wetlands set backs.
- Avoid WSSC manholes on shoulder of access road.

Data Collection Boring (DC-1)

• Located N.E. portion of Landfill in proximity to Airplane Park.

Data Collection Boring (DC-2)

• Located S.E. portion of Landfill in proximity to Soil Stockpile.

Data Collection Boring (DC-3)

Located South portion of Landfill in proximity to Tree Line.

Data Collection Boring (DC-4)

Located Center portion of Landfill in proximity to Interior Access Road.

Data Collection Boring (DC-5)

• Located West portion of Landfill in proximity to Perimeter Access Road.



ATTACHMENT D Tables



TABLE 1 SUMMARY OF EXISTING GROUNDWATER MONITORING WELL CONSTRUCTION DOCUMENTATION GUDE LANDFILL, 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND 20850

Well ID	Permit #	On-Site / Off-Site	Date Installed	Drilling Method	Diameter (inches)	Reported Total Depth (ft bgs)	Measured Total Depth - 10/22/2009 and 10/23/2009 (ft bgs)	Casing Depth (ft bgs)	Screen Depth (ft bgs)	Historic Depth to GW (ft bgs)	Geology
OB01	MO880058	On-Site	4/26/88	HSA / Mud Rotary	2	75	76.42	35	35-75	10-15	0-30 feet : unknown, 30-77 feet : rock
OB02	MO880059	On-Site	5/20/88	Mud Rotary	2	121	113.25	71	no screen - open from 71-121'	10-17	0-21 feet : red clay & saprolite, 21-121 feet : rock
OB02A	MO880060	On-Site	5/13/88	Mud Rotary	2	77	76.4	37	37-77	10-17	0-26.5 feet : unknown, 26.5-77 feet : rock
OB03	MO880061	On-Site	6/30/88	Mud Rotary	2	154	133.13	104	104-154	16-24	0-54 feet : red clay & saprolite, 54- 154 feet : rock
OB03A	MO880062	On-Site	7/8/88	Mud Rotary	2	97	94.55	50	50-97	15-25	0-47 feet : red clay & saprolite, 47-97 feet : rock
OB04	MO880063	Off-Site	7/22/88	Mud Rotary	2	136	131.66	86	86-136	1-3	0-30 feet : red clay & saprolite, 30-36 feet : decomposed rock, 36-136 feet : rock
OB04A	MO880064	Off-Site	7/29/88	Mud Rotary	2	83	81.92	33	33-83	1-4	0-3 feet : fill, 3-33 feet sandy silt with rock & quartz, 33-83 feet : rock
OB06	MO880065 *	Off-Site			2		66.63	Well Comple	etion Report Missing	4-10	
OB07	MO880066 *	Off-Site	8/7/88	Mud Rotary	2	81	142.87	31	31-81	2-10	0-31 feet : saprolite, 31-81 feet : rock
OB07A	MO880067 *	Off-Site	8/30/88	Mud Rotary	2	76	97.17	26	26-76	2-8	0-26 feet : clay & saprolite, 26-76 feet : rock
OB08	MO880068 *	On-Site	8/26/88	Mud Rotary	2	109	137.01	59	59-109	0-5	0-57 feet : saprolite, 57-109 feet : rock
OB08A	MO880069 *	On-Site	10/5/88	Mud Rotary	2	145	79.25	95	95-145	1-6	0-40 feet : saprolite, 40-145 feet : rock
OB10	MO880070 *	On-Site			2		66.82	Well Comple	etion Report Missing	1-5	
OB11	MO880071 *	On-Site	10/12/88	Mud Rotary	2	90	100.9	40	40-90	4-7	0-40 feet : saprolite, 40-90 feet : rock
OB11A	MO880072*	On-Site			2		64.3	Well Comple	etion Report Missing	3-7	
OB12	MO880073*	Off-Site			2		25.58	Well Completion Report Missing		12-17	
OB15	*	On-Site			4	27.5	22.79	Well Completion Report Missing		16-21	
OB25	*	On-Site			4	15	15.46	Well Completion Report Missing		3-7	
OB102	*	Off-Site			4	24.5	22.2	Well Completion Report Missing		7-11	
OB105	*	Off-Site			4	13	16.5	Well Comple	etion Report Missing	0-2	

Notes:

- 1. GW=groundwater
- 2. ft=feet
- HSA=hollow stem auger
- 5. *indicates missing well completion reports or reports that indicate conflicting well identification information and total depth measurements that do not match the total depths on the completion reports
 6. Reported total depth data is from well completion reports. For wells OB15, OB25, OB102 and OB105 the reported total depth data was provided by Montgomery County



TABLE 2 SUMMARY OF PROPOSED GROUNDWATER MONITORING WELLS 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND 20850

Well ID	Location	On-Site / Off-Site	Estimated Depth	Purpose
MW-1A/MW-1B	Northeastern landfill boundary, on M-NCPPC property. Reference pictures 1, 2, and 3 in the attached photographic log.	Off-Site	Shallow and deep well pair. Shallow well depth approximately 15 – 30 feet bgs. Deep well approximately 70 – 100 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments (shallow) and the bedrock (deep) in the area between existing wells OB04/OB04A and OB102.
MW-2A/MW-2B	Eastern landfill boundary, on M-NCPPC property. Reference pictures 4, 5 and 6 in the attached photographic log.	Off-Site	Shallow and deep well pair. Shallow well depth approximately $15-30$ feet bgs. Deep well approximately $70-100$ feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments (shallow) and the bedrock (deep) in the area between existing wells OB102 and OB08/OB08A.
MW-3A/MW-3B	Southeastern landfill boundary, on M-NCPPC property, east of existing well OB08/OB08A. Reference pictures 7 and 8 in the attached photographic log.	Off-Site	Shallow and deep well pair. Shallow well depth approximately 15 – 30 feet bgs. Deep well approximately 70 – 100 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments (shallow) and the bedrock (deep) in the area east of OB08/OB08A.
MW-4	Southeastern landfill boundary, on landfill property, adjacent to well OB10. Reference pictures 9 and 10 in the attached photographic log.	On-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide chemical analytical data in the unconsolidated shallow sediments in the area of OB10.
MW-5	Southern landfill boundary, on WSSC property, south of wells OB11 & OB25. Reference pictures 11, 12, and 13 in the attached photographic log.	Off-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments in the area south of OB11 and OB25. MW-5 would also provide data to evaluate whether the stream (north of the proposed location) is acting as a hydraulic barrier, potentially intercepting dissolved constituents migrating south of OB11 and OB25.
MW-6	Southwestern landfill boundary, on landfill property, adjacent to well OB01.	On-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide chemical analytical data in the unconsolidated shallow sediments in the area of OB01.
MW-7	Northwestern landfill boundary, on landfill property, down slope from soil stockpile.	On-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide chemical analytical data along northwest slope in the unconsolidated shallow sediments in the area southwest of OB03.
MW-8	Northwestern Landfill Boundary, on landfill property, adjacent to well OB03.	On-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide chemical analytical data along northwest slope in the unconsolidated shallow sediments in the area of OB03.
MW-9	West of landfill property in Derwood Station South, near Dubuque Court.	Off-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments in the area of Dubuque Court, west of the landfill boundary in Derwood Station South.
MW-10	Northwest of landfill property on M-NCPPC property, near Bettendorf Court. Reference pictures 15, 16, 17, and 18 in the attached photographic log.	Off-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments southeast of Bettendorf Court, northwest of the landfill boundary.
MW-11A/MW-11B	Northwest of landfill property on M-NCPPC property, near Bettendorf Court. Reference pictures 14 and 18 in the attached photographic log.	Off-Site	Shallow and deep well pair. Shallow well depth approximately 15 – 30 feet bgs. Deep well approximately 70 – 100 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments (shallow) and the bedrock (deep) in the area east of Bettendorf Court, northwest of the landfill boundary.
MW-12	Northwest of landfill property on M-NCPPC property, near Grinnell Terrace.	Off-Site	Shallow well depth, approximately 15 - 30 feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments in the area of Grinnell Terrace, northwest of the landfill boundary.
MW-13A/MW-13B	Northwestern landfill property boundary, near property corner. Reference pictures 19, 20, 21, and 22 in the attached photographic log.	On-Site	Shallow and deep well pair. Shallow well depth approximately $15-30$ feet bgs. Deep well approximately $70-100$ feet bgs.	To provide groundwater elevation data and chemical analytical data in the unconsolidated shallow sediments (shallow) and the bedrock (deep) in the area of the northwestern landfill property boundary.

Notes:

- 1. M-NCPPC=Maryland-National Capital Park and Planning Commission Property
- 2. bgs=below ground surface



TABLE 3 SUMMARY OF PROPOSED DATA COLLECTION BORINGS GUDE LANDFILL, 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND 20850

Boring ID	Location	On-Site / Off-Site	Estimated Depth	Purpose	
DC-1	Located in the northeast portion of the landfill in proximity to Airplane Park.	On-Site	Approximately 60 - 100 feet bgs.	To provide source chemical analytical data, waste mass characterization data, and groundwater elevation data in the northeast portion of the landfill.	
DC-2	Located in the southeast portion of the landfill in proximity to the soil stockpile.	On-Site	Approximately 60 - 100 feet bgs.	To provide source chemical analytical data, waste mass characterization data, and groundwater elevation data in the southeast portion of the landfill.	
	Located in the southern portion of the landfill in proximity to the tree line.	On-Site	Approximately 60 - 100 feet bgs.	To provide source chemical analytical data, waste mass characterization data, and groundwater elevation data in the southern portion of the landfill.	
	Located in the central portion of the landfill in proximity to the interior access road.	On-Site	Approximately 60 - 100 feet bgs.	To provide source chemical analytical data, waste mass characterization data, and groundwater elevation data in the central portion of the landfill.	
DC-5	Located in the western portion of the landfill in proximity to the perimeter access road.	On-Site	Approximately 60 - 100 feet bgs.	To provide source chemical analytical data, waste mass characterization data, and groundwater elevation data in the western portion of the landfill.	

Notes:

1. bgs=below ground surface